

Title Changes in the ultrastructure and texture of prawn muscle (*Macrobrachium rosenbergii*) during cold storage

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Abstract

Changes in the ultrastructure and proteolytic activity of prawn muscle were determined during storage at 5 °C, in order to better understand changes in physical and sensory texture measurements. Progressive deterioration of myofibril structure was observed during refrigeration of prawn for 14 d. The loss of density and order in Z-line alignment was first detected after 3 d of storage. Progressive disruption of Z-line, I-bands and M-lines was observed after 4–6 d of storage. Muscle degradation included pronounced disruption of the mitochondria as revealed by swollen cristae, loss of cristae material, and membrane breakage. Along with ultrastructural changes, decreased shear force values and mean textures scores were measured. An initial shear force value of 18.21 N/g decreased to 14.50, 12.46, and 10.79 N/g on days 3, 6, and 14, respectively. Mean texture scores indicated that prawn muscle maintained firm texture during 0–3 d of storage, and became soft during 4–6 d of storage. After 6 d of storage, the prawn texture was very soft. Increased deterioration of the muscle ultrastructure coincided with the increase of proteolytic microorganisms and salt soluble muscle proteins found by Sodium dodecyl sulfate-polyacrylamide gel electrophoresis. It is concluded that the weakening of the ultrastructure is related to proteolytic activity and results in a more soft texture in prawns.